

AMENDMENTS TO THE CLAIMS:

1. (Currently Amended) An image-capturing apparatus comprising:
an image-capturing unit having a plurality of pixels disposed two-dimensionally;
an addition pattern generating unit configured to specify an addition pattern;
an adding unit ~~that generates~~configured to generate an image by ~~adding~~adding,
according to the addition pattern, outputs of selected pixels present around a given pixel at the
image-capturing unit to an output of the given ~~pixel;~~pixel, wherein the selected pixels are chosen
according to the addition pattern; and
an image processing unit ~~that processes~~configured to process the image resulting from
addition executed by the adding ~~unit;~~unit, according to a type of image processing; and
an addition pattern generating unit that generates an addition pattern with which pixel
outputs are added together by the adding unit in correspondence to a type of image processing to
be executed by the image processing unit.
wherein:
the addition pattern generating unit specifies different addition patterns corresponding to
different types of image processing; and
when the image processing unit switches from a first type of image processing to a
second type of image processing;
the addition pattern generating unit changes the specified addition pattern from an
addition pattern corresponding to the first type of image processing to an addition pattern
corresponding to the second type of image processing; and

the adding unit switches from the addition pattern corresponding to the first type of image processing to the addition pattern corresponding to the second type of image processing when adding outputs of selected pixels.

2. (Original) An image-capturing apparatus according to claim 1, wherein:
when the image processing unit is to execute image processing for detecting an edge in the image, the addition pattern generating unit generates the addition pattern in correspondence to a type of edge to be detected by the image processing unit.
3. (Original) An image-capturing apparatus according to claim 1, wherein:
when the image processing unit is to execute image processing for detecting a predetermined target object, the addition pattern generating unit generates the addition pattern in correspondence to the target object to be detected by the image processing unit.
4. (Original) An image-capturing apparatus according to claim 1, wherein:
when the image processing unit changes the type of image processing for each captured image frame, the addition pattern generating unit generates the addition pattern in correspondence to the type of image processing for the each captured image frame.
5. (Original) An image-capturing apparatus according to claim 2, wherein:
when the image processing unit changes the type of edge to be detected for each captured image frame, the addition pattern generating unit generates the addition pattern in correspondence to the type of edge to be detected which is altered for the each captured image frame.
6. (Original) An image-capturing apparatus according to claim 1, wherein:

a number of pixels the outputs of which are added together with the addition pattern generated by the addition pattern generating unit in correspondence to the type of image processing is adjusted in conformance to one of a frame rate and a length of exposure time set for the image-capturing unit.

7. (Original) An image-capturing apparatus according to claim 2, wherein:

a number of pixels the outputs of which are added together with the addition pattern generated by the addition pattern generating unit in correspondence to the type of edge to be detected is adjusted in conformance to one of a frame rate and a length of exposure time set for the image-capturing unit.

8. (Original) An image-capturing apparatus according to claim 3, wherein:

a number of pixels the outputs of which are added together with the addition pattern generated by the addition pattern generating unit in correspondence to the target object to be detected is adjusted in conformance to one of a frame rate and a length of exposure time set for the image-capturing unit.

9. (Currently Amended) An image-capturing apparatus comprising:

an image-capturing unit having a plurality of pixels disposed two-dimensionally;
an addition pattern generating unit configured to specify an addition pattern according to a vehicular behavior detected by a vehicular behavior detection device;
an adding unit ~~that generates~~configured to generate an image by ~~adding-adding~~
according to the addition pattern, outputs of selected pixels present around a given pixel at the image-capturing unit to an output of the given ~~pixel~~pixel, wherein the selected pixels are chosen according to the addition pattern; and

an image processing unit ~~that processes~~configured to process the image resulting from addition executed by the adding unit; and

~~an addition pattern generating unit that generates an addition pattern with which pixel outputs are added together by the adding unit in correspondence to vehicular behavior detected by a vehicular behavior detection unit.~~

wherein:

the addition pattern generating unit specifies different addition patterns corresponding to different types of vehicular behaviors; and

when the detected vehicular behavior changes from a first type of vehicular behavior to a second type of vehicular behavior;

the addition pattern generating unit changes the specified addition pattern from an addition pattern corresponding to the first type of vehicular behavior to an addition pattern corresponding to the second type of vehicular behavior; and

the adding unit switches from the addition pattern corresponding to the first type of vehicular behavior to the addition pattern corresponding to the second type of vehicular behavior when adding outputs of selected pixels.

10. (Currently Amended) An image-capturing apparatus comprising:

an image-capturing unit having a plurality of pixels disposed two-dimensionally;
an addition pattern generating unit configured to specify an addition pattern according to a type of vibration of the image-capturing apparatus detected by a vibration detection unit;

an adding unit that ~~generates~~configured to generate an image by adding ~~adding~~ according to the addition pattern, outputs of selected pixels present around a given pixel at an

image-capturing unit having a plurality of pixels disposed two-dimensionally to an output of the given pixel; pixels, wherein the selected pixels are chosen according to the addition pattern; and

an image processing unit that processes configured to process the image resulting from addition executed by the adding unit; and

an addition pattern generating unit that generates an addition pattern with which pixel outputs are added together by the adding unit in correspondence to results of a vibration detection executed by a vibration detection unit that detects a vibration of the image-capturing apparatus; wherein:

the addition pattern generating unit specifies different addition patterns corresponding to different types of vibration of the image-capturing apparatus; and

when the detected vibrations of the image-capturing apparatus changes from a first type of vibration to a second type of vibration;

an addition pattern generating unit changes the specified addition pattern from an addition pattern corresponding to the first type of vibration to an addition pattern corresponding to the second type of vibration; and

the adding unit switches from the addition pattern corresponding to the first type of vibration to the addition pattern corresponding to the second type of vibration when adding outputs of selected pixels.

11. (Original) An image-capturing apparatus according to claim 1, further comprising:
an A/D converter that converts an analog image signal to a digital image signal, wherein:
a number of bits output from the A/D converter is set to a value obtained by adding \log_2 (number of pixels used for addition) to a number of bits output from the adding unit.
12. (Original) An image-capturing apparatus according to claim 9, further comprising:

an A/D converter that converts an analog image signal to a digital image signal, wherein:

a number of bits output from the A/D converter is set to a value obtained by adding \log_2 (number of pixels used for addition) to a number of bits output from the adding unit.

13. (Original) An image-capturing apparatus according to claim 10, further comprising:

an A/D converter that converts an analog image signal to a digital image signal, wherein:

a number of bits output from the A/D converter is set to a value obtained by adding \log_2 (number of pixels used for addition) to a number of bits output from the adding unit.

14. (Currently Amended) An image-capturing apparatus comprising:

image-capturing means, having a plurality of pixels disposed two-dimensionally, for capturing images;

addition pattern generating means for generating an addition pattern;

adding means for generating an image by ~~adding~~ adding, according to the addition pattern, outputs of selected pixels present around a given pixel at the image-capturing means to an output of the given ~~pixel~~ pixels, wherein the selected pixels are chosen according to the addition pattern; and

image processing means for processing the image resulting from addition executed by the adding means; means, according to a type of image processing; and

addition pattern generating means for generating an addition pattern with which pixel outputs are added together by the adding means in correspondence to a type of image processing to be executed by the image processing means.

wherein:

the addition pattern generating means specifies different addition patterns corresponding to different types of image processing; and

when the image processing means switches from a first type of image processing to a second type of image processing;

the addition pattern generating means changes the specified addition pattern from an addition pattern corresponding to the first type of image processing to an addition pattern corresponding to the second type of image processing; and

the adding means switches from the addition pattern corresponding to the first type of image processing to the addition pattern corresponding to the second type of image processing when adding outputs of selected pixels.

15. (Currently Amended) An image-capturing apparatus comprising:
image-capturing means, having a plurality of pixels disposed two-dimensionally, for generating images;

addition pattern generating means for specifying an addition pattern according to a vehicular behavior detected by a vehicular behavior detection device;

adding means for generating an image by adding adding, according to the addition pattern, outputs of pixels present around a given pixel at the image-capturing means to an output of the given pixel; pixel, wherein the selected pixels are chosen according to the addition pattern;
and

image processing means for processing the image resulting from addition executed by the adding means; and

addition pattern generating means for generating an addition pattern with which pixel outputs are added together by the adding means in correspondence to vehicular behavior detected by a vehicular behavior detection means.

wherein:

the addition pattern generating means specifies different addition patterns corresponding to different types of vehicular behaviors; and

when the detected vehicular behavior changes from a first type of vehicular behavior to a second type of vehicular behavior;

the addition pattern generating means changes the specified addition pattern from an addition pattern corresponding to the first type of vehicular behavior to an addition pattern corresponding to the second type of vehicular behavior; and

the adding means switches from the addition pattern corresponding to the first type of vehicular behavior to the addition pattern corresponding to the second type of vehicular behavior when adding outputs of selected pixels.

16. (Currently Amended) An image-capturing apparatus comprising:

an image-capturing means, having a plurality of pixels disposed two-dimensionally, for capturing images;

an addition pattern generating means for specifying an addition pattern according to a type of vibration of the image-capturing means detected by a vibration detection unit;

adding means for generating an image by adding-adding, according to the addition pattern, outputs of selected pixels present around a given pixel at an image-capturing means having a plurality of pixels disposed two-dimensionally to an output of the given pixel; pixel, wherein the selected pixels are chosen according to the specified addition pattern; and

image processing means for processing the image resulting from addition executed by the adding means; and

addition pattern generating means for generating an addition pattern with which pixel outputs are added together by the adding means in correspondence to results of a vibration

detection-executed-by-a-vibration-detection-means-for-detecting-a-vibration-of-the-image-capturing-apparatus:

wherein:

the addition pattern generating means specifies different addition patterns corresponding to different types of vibration of the image-capturing apparatus; and

when the detected vibrations of the image-capturing means changes from a first type of vibration to a second type of vibration:

the addition pattern generating means changes the specified addition pattern from an addition pattern corresponding to the first type of vibration to an addition pattern corresponding to the second type of vibration; and

the adding means switches from the addition pattern corresponding to the first type of vibration to the addition pattern corresponding to the second type of vibration when adding outputs of selected pixels.

17. (Currently Amended) An image-capturing method comprising:

generating an addition pattern according to a type of image processing;

generating an image by adding, according to the addition pattern, outputs of selected pixels present around a given pixel at an image-capturing unit having a plurality of pixels disposed two-dimensionally to an output of the given pixel; wherein the selected pixels are chosen according to the addition pattern, and different addition patterns are generated corresponding to different types of image processing; and

processing the image resulting from addition of pixel outputs, according to the type of image processing; outputs; and

generating an addition pattern with which the pixel outputs are added together in correspondence to a type of image processing to be executed.

wherein when the processing the image switches from a first type of image processing to a second type of image processing:

the addition pattern is changed from an addition pattern corresponding to the first type of image processing to an addition pattern corresponding to the second type of image processing; and

the adding of the outputs of selected pixels is changed from utilizing the addition pattern corresponding to the first type of image processing to utilizing the addition pattern corresponding to the second type of image processing.

18. (Currently Amended) An image-capturing method comprising:

generating an addition pattern according to a detected vehicular behavior, wherein different addition patterns corresponding to different types of vehicular behaviors;

generating an image by adding-adding, according to the addition pattern, outputs of selected pixels present around a given pixel at an image-capturing unit having a plurality of pixels disposed two-dimensionally to an output of the given pixel;pixel, wherein the selected pixels are chosen according to the addition pattern;

processing the image resulting from addition of pixel outputs; and

generating an addition pattern with which the pixel outputs are added together in correspondence to vehicular behavior detected by a vehicular behavior detection unit.

wherein:

when the detected vehicular behavior changes from a first type of vehicular behavior to a second type of vehicular behavior;

the addition pattern is changed from an addition pattern corresponding to the first type of vehicular behavior to an addition pattern corresponding to the second type of vehicular behavior; and

the adding of the outputs of selected pixels is changed from utilizing the addition pattern corresponding to the first type of vehicular behavior to utilizing the addition pattern corresponding to the second type of vehicular behavior.

19. (Currently Amended) An image-capturing method comprising:

generating an addition pattern according to a type of vibration of an image-capturing apparatus, wherein different addition patterns are generated corresponding to different types of vibration of the image-capturing apparatus;

generating an image by adding, according to the addition pattern, outputs of selected pixels present around a given pixel at an image-capturing unit having a plurality of pixels disposed two-dimensionally to an output of the given pixel; wherein the selected pixels are chosen according to the addition pattern; and

processing the image resulting from addition of pixel outputs; and

generating an addition pattern with which the pixel outputs are added together in correspondence to a vibration that causes the image to be blurred.

wherein:

when the detected vibrations of the image-capturing apparatus changes from a first type of vibration to a second type of vibration;

the generated addition pattern is changed from an addition pattern corresponding to the first type of vibration to an addition pattern corresponding to the second type of vibration; and

the adding of the outputs of selected pixels is changed from utilizing the addition pattern corresponding to the first type of vibration to utilizing the addition pattern corresponding to the second type of vibration when adding outputs of selected pixels.